SONY

3-765-649-11 (1)

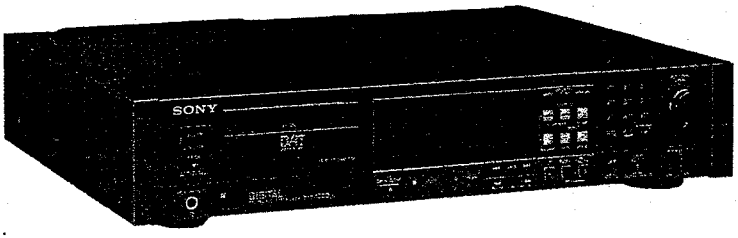
DIGITAL AUDIO TAPE DECK

DTC-1000ES

OPERATING INSTRUCTIONS page 3

Before operating the unit, please read this manual thoroughly and retain it for future reference.

DAT
Digital Audio Tape



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English

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Warning

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

NOTICE FOR THE CUSTOMERS IN THE UNITED KINGDOM

IMPORTANT
The wires in this mains lead are coloured in accordance with the following code:

Blue : Neutral
Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Overview

Advanced digital audio technology was introduced into the consumer audio field through the Compact Disc player, currently in wide use throughout the world. And now, DAT (Digital Audio Tape) recorder, the second generation of digital audio recording equipment has been released.

Excellent sound quality
By digitalizing and accurate processing of the audio signal, the recording/playback is made with lower wow and flutter, wider dynamic range, lower distortion rate, and superb signal-to-noise ratio.
The audio signal is recorded and played back with the PCM (Pulse Code Modulation) system. For superior performance and higher fidelity, the four-times oversampling digital filter and D/A converter unit are employed for the left and right channels independently.

Smaller cassette
A small cassette of 73×54×10.5 mm with a tape width of 3,81 mm, which was developed and standardized exclusively for the DAT format, is used with this deck.

Writable sub codes
"Sub code" is the coded signal written on the tape independently from the audio signal, and is mainly used for convenience and variety of playback or tape editing. In the DAT format, you can write and erase the information in this "sub code" area.
With this deck, the following sub codes can be written or re-written without affecting the PCM audio signal section.
- Start ID* (code indicating the beginning of a selection)
- Program number (indicates the order of a selection)
- Skip ID (code for skip operation)

*ID stands for "identification".

High-speed search
By detecting the sub code, the desired points on the tape such as the beginning of the selection can be searched for at high speed. For details, refer to page 22.

Skip operation
During playback, if a skip ID has been written, the unit skips to the point where the next start ID is located, and playback starts again.

Digital IN/OUT jacks
When this deck is connected to another DAT deck having digital input and/or output jacks, tape-to-tape dubbing is possible with no deterioration in sound quality. When a DA converter unit (such as the Sony DAS-702ES or DAS-703ES) is connected to this digital output, digital sound reproduction will be enhanced.

Four DD (direct-drive) motors for higher reliability
A direct-drive motor is provided for capstan, head drum and supply/take-up reels respectively. These motors enhance the reliability and provide higher stability over extended periods of use.

Multi-functional counter
You can select the following information to be displayed:
- Linear tape counter
- Remaining time
- Elapsed playback time

Easy-to-read multi-mode display
The status and operation mode indications of the deck, such as sampling frequency, emphasis ON/OFF indicator, copy prohibit, and warning of the moisture condensation, etc. are concentrated in the large display window.

For details, refer to "Technical information" on page 30.

Precautions

On safety

- The unit is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the unit itself has been turned off.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- Should any solid object or liquid fall into the unit, unplug the unit and have it checked by qualified personnel before operation it any further.

On cleaning the cabinet

Clean the cabinet, panel and controls with a soft cloth lightly moistened with mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

If you have any question or problem concerning you unit that is not covered in this manual, please consult your nearest Sony dealer.

Moisture condensation

If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit. In this condition, the tape may adhere to the head drum and be damaged, or the unit may not operate correctly. Although the unit is furnished with moisture sensors to prevent possible damage under these circumstances, do not leave the cassette inside the compartment. Always remove the cassette when the unit will not be used.

If moisture is present...

- No function button except the ⏏ OPEN/CLOSE button will work.
- The recording will stop.

When the CAUTION indicator blinks and the unit will not operate

Open the cassette compartment by pressing the ⏏ OPEN/CLOSE button and remove the cassette. Leave the unit turned on for about an hour with the cassette compartment open to evaporate the moisture.

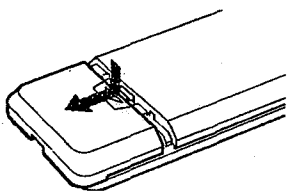
Notes on installation

- Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Good air circulation is essential to prevent internal heat build-up in the unit. Place the unit in a location with adequate air circulation. Do not place the unit on a soft surface.

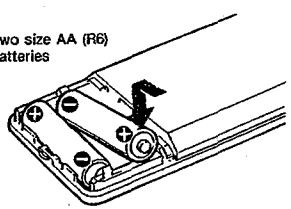
Installing batteries

Install the batteries in the supplied remote commander for remote control operation.

1



2 Two size AA (R6) batteries



Do not throw away the carton and packing material!
It will be an ideal container when transporting the deck for repair work, etc.

To avoid battery leakage
When the commander will not be used for a long period of time, remove the batteries to avoid damage caused by battery leakage and corrosion.

Battery life
About half a year of normal operation can be expected when using the Sony SUM-3 (NS) batteries.
When the batteries are exhausted, the remote commander cannot operate the deck. Replace both batteries with new ones.

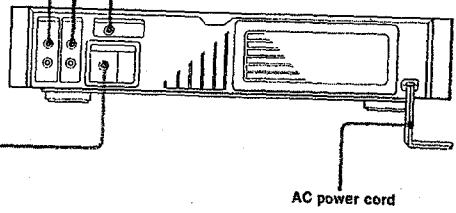
Connections

Description of the rear panel

DIGITAL IN jack
The digital signal from another DAT deck or other digital source is input for digital recording. Connect this jack to the digital signal output of another DAT deck or other digital source.

LINE OUT jacks
Connect to the DAT or tape inputs of an amplifier. The playback signal of this deck will be output.

LINE IN jacks
Connect to the recording outputs of an amplifier. The signal from the source equipment connected to the amplifier is supplied to this deck.



DIGITAL OUT jack
Outputs the digital signal reproduced by this deck. Connect this jack to the digital signal input of a D/A converter or another DAT deck.

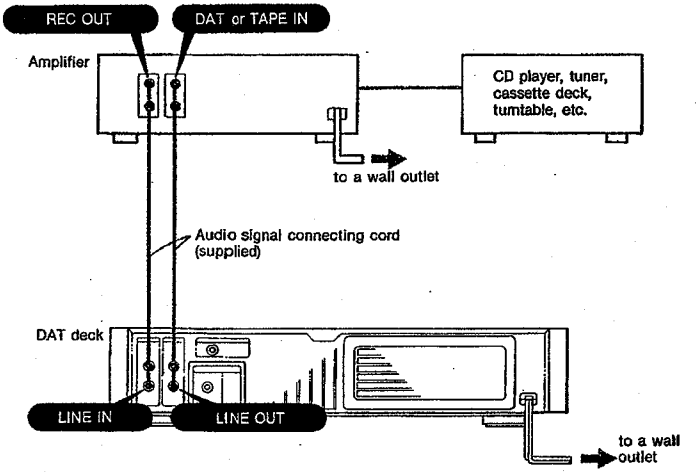
AC power cord

Before Connection

- Turn off the power for all equipment before making connections.
- Be sure to insert the plugs firmly into the jacks. Loose connections may cause hum and noise.
  When unplugging, be sure to grasp the plug and not the cord.
- Connect the red plug of the supplied connecting cord to the right-channel jack (R) and the white plug to the left-channel jack (L) correctly.

Power cord
A white mark is visible on one lead of the power cord. This will help you drive the DAT deck and other components in the system "in phase" by aligning the AC power cord polarities with AC outlet polarities, so that the best possible sound quality is obtained. In most cases, the white-marked plug of the DAT deck should be inserted into the negative potential (ground side) of the wall outlet.

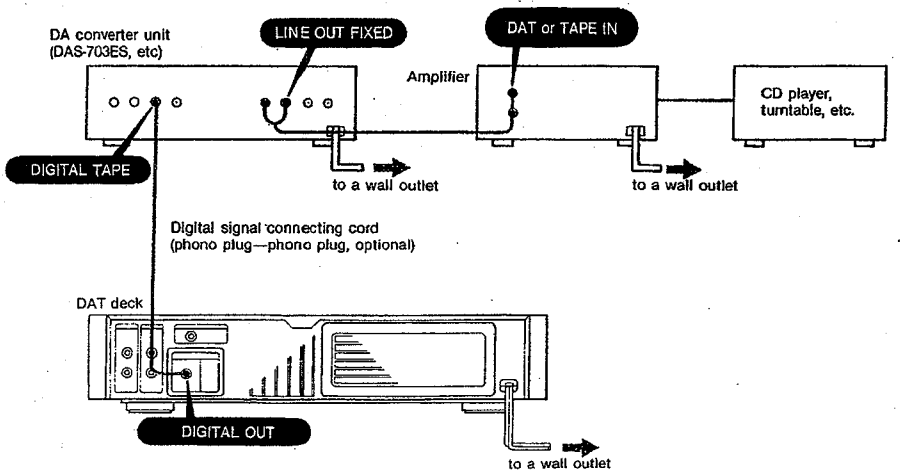
Basic connection diagram



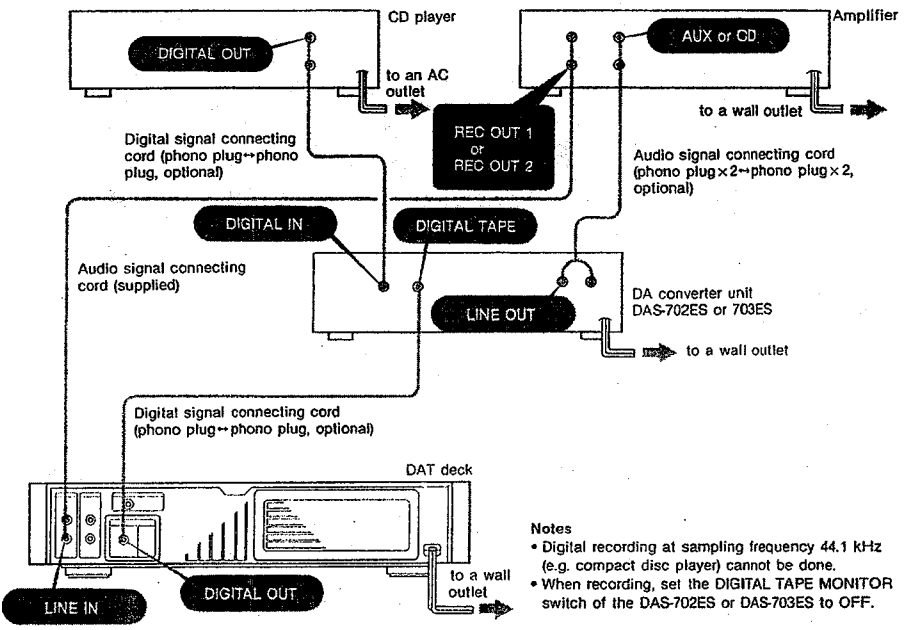
Setting of the input selector of the amplifier
Set the input selector of the amplifier to DAT when this deck is connected to the DAT input jacks, or to TAPE when connected to the TAPE input jacks.

Connection for playback using the DA converter unit

When this deck is connected to the external DA converter unit DAS-702ES or DAS-703ES (optional), you may enjoy the separate digital tape system.



Connection when a CD player is connected directly to the DA converter unit



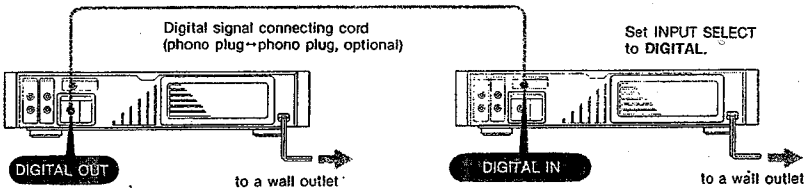
Notes

- Digital recording at sampling frequency 44.1 kHz (e.g. compact disc player) cannot be done.
- When recording, set the DIGITAL TAPE MONITOR switch of the DAS-702ES or DAS-703ES to OFF.

Connection for digital-to-digital dubbing

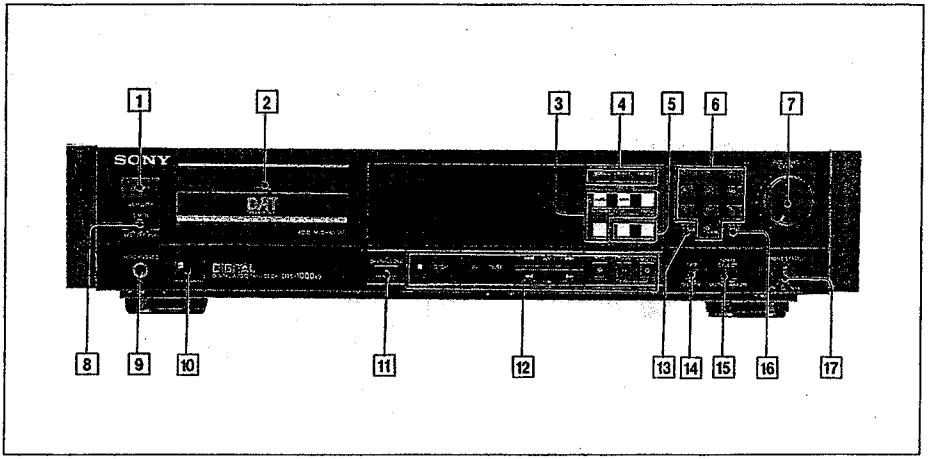
Playback deck
DAT deck
DA converter unit (DAS-702ES or 703ES, etc.)

For recording
DAT deck


Digital signal connecting cord (phono plug↔phono plug, optional)
Set INPUT SELECT to DIGITAL.
DIGITAL OUT
to a wall outlet
DIGITAL IN
to a wall outlet

Note
When the COPY PROHIBIT indicator blinks, digital dubbing cannot be done.

Location and function of controls



1 POWER switch

2 Cassette compartment
Insert a cassette with the window side up and the safety tab facing toward you.

3 START ID buttons and indicators
Used to write and erase the start ID codes, and to renumber and erase the program numbers.
AUTO (automatic): Press to write the start ID automatically during recording. When the recording level returns to the fixed level after having been below it for more than 3 seconds, the start ID is written on the tape for 9 seconds.
MAN (manual): Press to write the start ID at the desired point during recording. The MAN indicator lights. The start ID is written on the tape for 9 seconds.
ERASE: Press to erase a start ID. When a start ID and a program number are written on the tape, both codes are simultaneously erased by pressing this button.
RENUMBER: Press to renumber the program numbers. When only the start IDs are written, pressing this button will insert program numbers. When this button is pressed, the tape is rewound to the beginning automatically and program numbers are assigned from "1" in numerical order.

4 COUNTER buttons
MODE: Changes the counter indication in the display window from the tape running time, to elapsed time of the selection, to total remaining time of the tape, and back to the tape running time again.
RESET: Resets the counter to "0M 00S".
MEMORY: Stores the point where the counter is reset in memory.

5 SKIP ID buttons and indicators
WRITE: Press to write a skip ID onto the tape.
ERASE: Press to erase a skip ID which is written at the point just before the current position.

6 Numeric buttons (0–9)
Press to designate the program number.

7 REC LEVEL (recording level) controls
Adjust the recording level. The outer knob controls the left channel level and the inner knob the right channel level.

8 TIMER switch
Normally set to OFF. Used to start recording or playback at the desired time using a commercially available audio timer.

9 **HEADPHONES jack** (stereo phone jack)

10 **Remote sensor**

11 **▲ OPEN/CLOSE button and indicator**

12 **Tape operation buttons**
- **■ STOP button**
- **► PLAY button**
- **►► CUE (fast-forward/cue) button**
- **◄◄ REVIEW (rewind/review) button**
- **I◄◄ AMS:** Press to locate the beginning of the selection in reverse direction.
- **►►I AMS:** Press to locate the beginning of the selection in forward direction.
- **● REC (recording) button**
- **II PAUSE button:** If the pause mode continues for about 10 minutes, it will be released automatically and the deck will enter the stop mode.
- **O REC MUTE (record muting) button**

13 **CLEAR button**
Used to cancel the selection number which has been entered mistakenly.

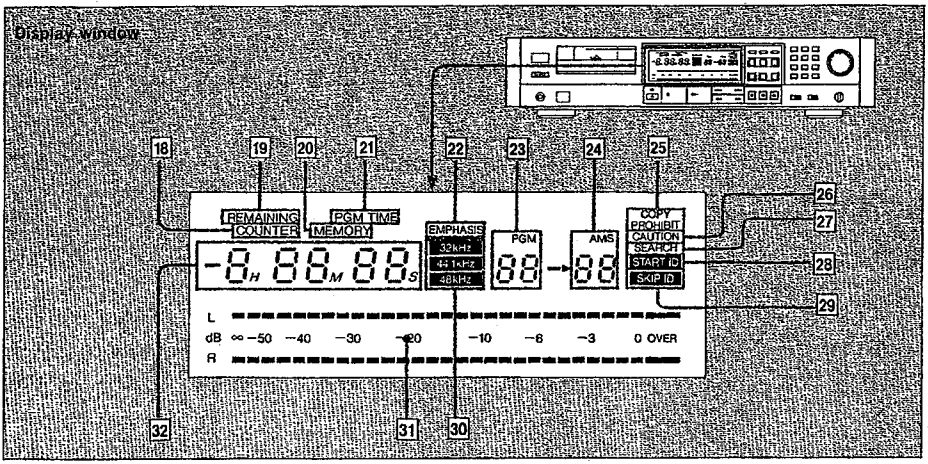
14 **SKIP switch**
Set this switch to ON to skip during playback the selections coded with a skip ID code. Set it to OFF to play back the whole tape as it is.

15 **INPUT SELECT switch**
ANALOG: For recording from the equipment connected to the LINE IN jacks on the rear panel.
DIGITAL: For recording from the equipment connected to the DIGITAL IN jack on the rear panel.

16 **START button**
Starts playback from the designated selection or activates the music scan operation.

17 **PHONES LEVEL (headphones level) control**

For the connecting jacks on the rear panel, refer to page 5.



18 COUNTER indicator
Lights up to show that the counter is displaying the tape running time.

19 REMAINING indicator
Lights up to show that the counter is displaying the remaining time.
The remaining time is not displayed during search operation (the SEARCH indicator lights), fast-forwarding or rewinding.

20 MEMORY indicator
Lights up when the MEMORY button is pressed to show that the " 0M 00S" point is stored in memory.

21 PGM TIME (program time) indicator
Lights up to show that the counter is displaying the elapsed time of the current selection.

22 EMPHASIS indicator
Lights up when recording a digital signal input from the DIGITAL IN jack contains a pre-emphasized signal. In the playback mode, it also lights up while the detected pre-emphasized signal is being de-emphasized.

23 PGM (program number) display
Shows the program number of the selection being played.

24 AMS (automatic music sensor) display
Shows the number of selections to be skipped ahead or behind in AMS operation. When a numeric button is pressed, the display shows the program number of the target selection while the selection is being searched for.

25 COPY PROHIBIT (digital copy prohibit) indicator
Blinks when the digital signal to be recorded contains a "digital copy prohibit" code. In this case, digital-to-digital recording cannot be done.

26 CAUTION indicator
Blinks when moisture condensation occurs. If this happens, the deck stops automatically.

27 SEARCH indicator
Lights up while a selection is being searched for.

28 START ID indicator
Blinks when writing or erasing a start ID code, or when the start ID is detected during playback.

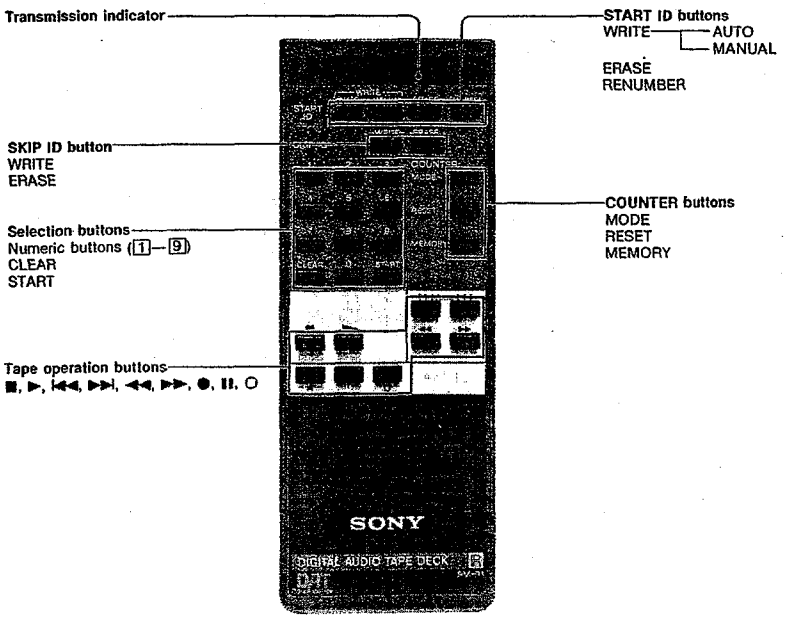
29 SKIP ID indicator
Lights up momentarily when writing or erasing a skip ID code, or when the skip ID is detected during playback.

30 Sampling frequency indicators
Indicates the sampling frequencies (32 kHz, 44.1 kHz, 48 kHz) with which the digital program is encoded.
44,1 kHz: For playback of pre-recorded DAT tape (Digital-to-digital recording cannot be done.)
48 kHz: For recording/playback with DAT tape

31 Peak level meters
Indicate the level of the audio signal being recorded during recording, and the peak values of the audio signal recorded on the tape during playback.

32 Counter
Displays the tape running time, elapsed time of the selection being played, and the total remaining time of the tape. Each time COUNTER MODE is pressed, the display mode changes in turn. (See page 25.)

Remote commander and operations



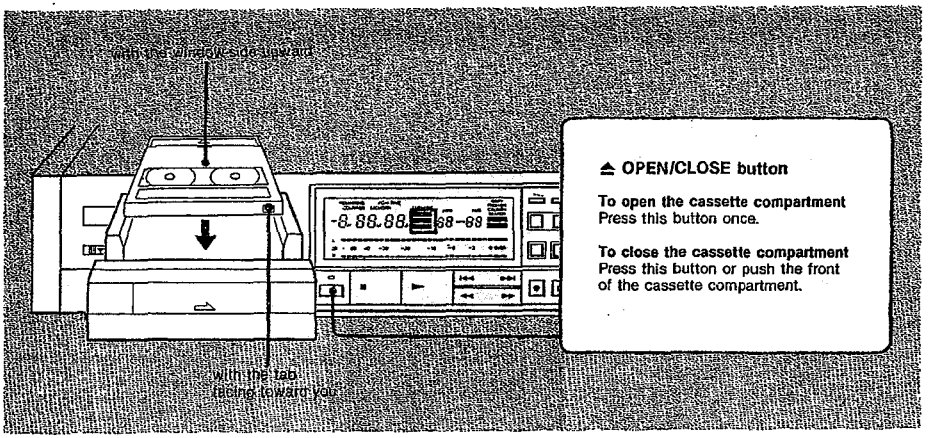
Each buttons on the remote commander functions in the same way as those having the same name on the front panel. However, the following operations cannot be performed on the remote commander. Use the front panel controls instead.

- Power ON/OFF
- Open/close the cassette compartment
- Digital/analog input source select
- Level adjustment (recording level and headphone level)
- Skip function ON/OFF
- Timer recording playback setting

Notes on remote control

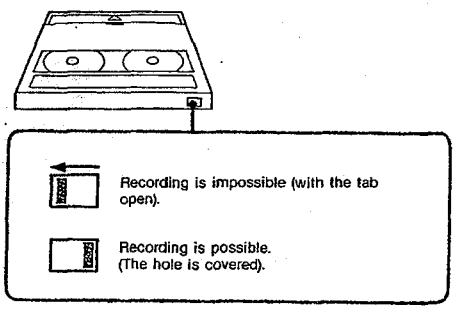
- Do not expose the remote sensor on the deck to strong light such as direct sunlight, lighting apparatus, etc.
- Do not place any obstructions between the remote commander and the remote sensor, or else operations will not be performed correctly.
- The controllable range is limited. Point the remote commander directly at the remote sensor on the deck.
- When remote control operation distance becomes shorter, the batteries are weak. Replace both batteries with new ones.

Inserting a cassette


with the window side upward
with the tab facing toward you
⏏ OPEN/CLOSE button
To open the cassette compartment
Press this button once.
To close the cassette compartment
Press this button or push the front of the cassette compartment.

When ⏏ OPEN/CLOSE is pressed
The red lamp above the button blinks to show that the internal mechanism moves for several seconds. During blinking, none of the control buttons except ▶ PLAY functions.

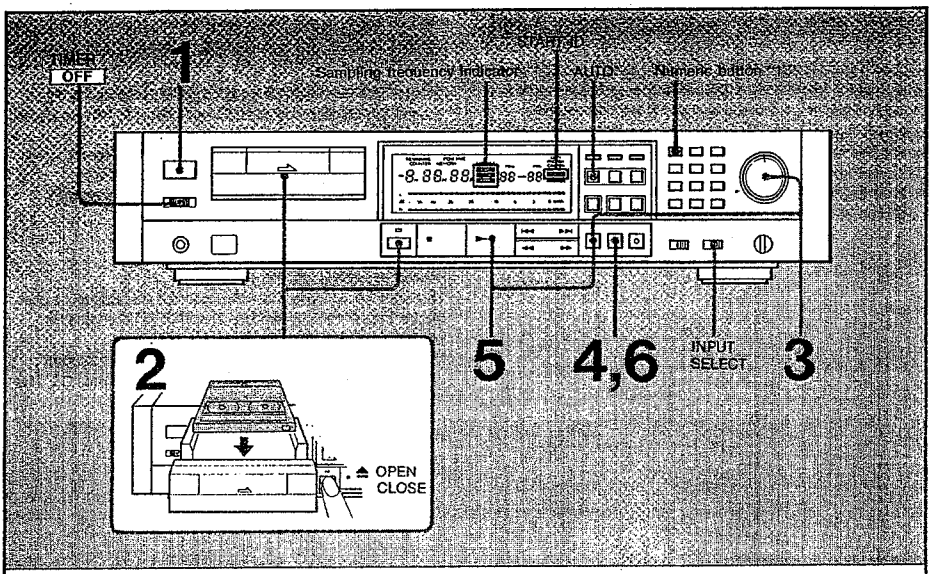
Safety tab on the cassette
When recording is made, any previous recorded signal will be automatically erased. To prevent accidental erasure, set the safety tab to the position as shown in the figure on the right. To record on a cassette, make sure that the tab is set to the record-possible position.



Note
After the power is turned on, the ❚❚ PAUSE indicator blinks. During blinking, none of the control buttons except ⏏ OPEN/CLOSE functions.

Cassette care
- Unlike analog audio tape, the digital audio tape can be played back and recorded on only one side of the cassette.
- Do not attempt to disassemble the dust-resistant cassette casing.
- If you insert the cassette incorrectly, the cassette compartment closes and then opens again automatically.
- Never insert anything in the small holes on the rear of the cassette.

Recording



1 **Depress POWER.**

2 **Insert a cassette.**

3 **Adjust the recording level.**
1) Press REC. (The ● indicator lights up in red.)
2) Play the program source to be recorded.
3) While observing the peak level meters, adjust the level for both channels.
(Refer to "Recording level adjustment".)

4 **Press PAUSE.**

5 **While pressing REC, press PLAY.**
The ❚❚, ● and ▶ indicators light up and the deck enters the record-pause mode.

6 **Press PAUSE to start recording.**
The ❚❚ indicator goes off.

To interrupt recording

To stop recording	Press ■.
To stop recording for a moment To release pause	Press ❚❚. Press ❚❚ again.
To remove the cassette	Press ⏏.

When the tape is recorded to the end
The tape is rewound to the beginning and stops automatically. (Auto rewind function)

Digital/analog input selection

Input signal	Connection Connected equipment → DAT deck	INPUT SELECT switch setting
Digital	DIGITAL OUT → DIGITAL IN	DIGITAL
Analog	LINE OUT → LINE IN	ANALOG

Recording level adjustment

Adjust the recording level with REC LEVEL so that the peak level meters do not exceed the 0 dB point at the highest level. If the meters exceed 0 dB, the OVER indicator lights in red. If the indicator lights up steadily, lower the recording level to avoid distortion of the recorded sound.
A little practice and experience will allow you to set the optimum recording levels.

Writing the sub codes automatically during recording

1 To write the **start ID codes** (selection start mark), make sure that the AUTO indicator is lit. If not, press AUTO.
To write the **program number** (selection order), after setting the deck to the record-pause mode at "Recording" step 5, press the numeric button "1".

2 Start recording.

When recording starts...
The start ID is written on the tape for 9 seconds at the beginning of each selection. The START ID indicator blinks.
At the same time the start ID is written, the program number is written on the tape sequentially from "1". The PGM display shows the current number.

For more details, refer to page 17.

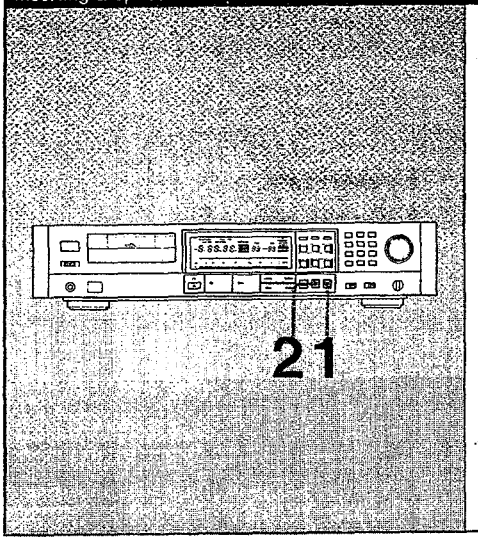
When the following occur during recording

If recording does not start when REC and PLAY are pressed...
Check the following items:
- The safety tab of the cassette is set to the record-inhibit position.
- No cassette is loaded.
- Control buttons are pressed incorrectly. (Press PLAY while pressing REC.)
- INPUT SELECT is set to the incorrect position.
- Tape is fully rewound to the end.
- The START ID indicator is blinking.

The cassette compartment does not open when ≙ is pressed
- Power is turned off.

The cassette is rejected after being loaded
- The cassette is loaded incorrectly.

Inserting a space between selections—Record muting



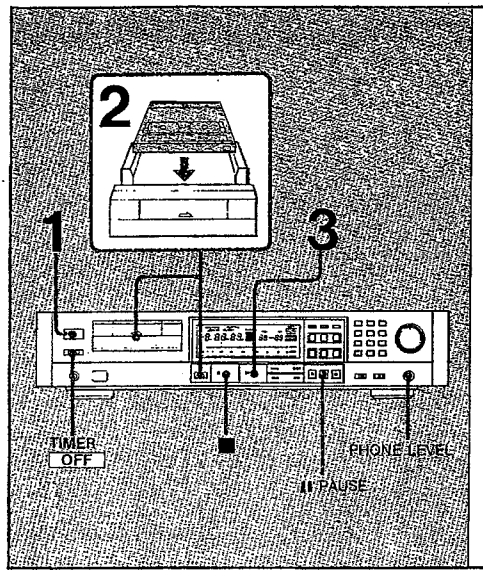
1 **During recording, press O REC MUTE where no-signal recording is required.**
Record muting is activated and the ▮▮ indicator blinks. After approx. 4 seconds, the ▮▮ indicator lights up steadily, and the deck enters the pause mode.

2 **To resume recording, press ▮▮.**
Recording begins again.

To insert a space of more than 4 seconds
During recording, keep O pressed for as long as you want to make a recorded portion with no signals. After approx. 4 seconds, the ▮▮ indicator flickers rapidly. When you release O to end the record muting, the deck enters the pause mode.

For details on the no-signal recorded portions on the tape, refer to page 24.

Playback



1 **Depress POWER.**

2 **Insert a cassette.**

3 **Press PLAY.**
Playback begins.

To stop playback

To stop playback	Press ■.
To stop playback for a moment To release pause	Press II. Press II again.
To remove the cassette	Press ⏏.

To fast-forward or rewind the tape while listening to the sound—Cue/review

To advance tape playback (cue)	Press ▶▶ during playback.	Sound is heard while the button is pressed.
To review tape playback	Press ◀◀ during playback.	Release the button at the desired point. Playback resumes.

Locating the beginning of the selection

For this operation, start ID codes must have been entered previously. Using |◀◀ AMS ▶▶|, the beginning of the desired selection on the tape can be located quickly. For details, refer to "Locating the beginning of the selection (AMS)" on page 22.

Headphone level adjustment
Adjust the headphone level with PHONE LEVEL.

When the tape reaches the end
The tape is rewound to the beginning of the tape and stops automatically.

Important
Since the digital audio tape boasts a wide dynamic range, the peaks of high level inputs are recorded with high fidelity, and the noise level is very low.
Do not turn up the volume while listening to a portion with no audio signals or very low level inputs. If you do, the speakers may be damaged when a peak level portion is played.

Restarting playback after rewind—Auto play

With this function the deck starts playback automatically from the beginning of the tape after rewind.

1

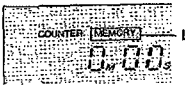
When this indicator lights, press MEMORY so that the indicator goes off.

2 While pressing ◀◀, press PLAY.
When the tape is rewound completely, playback starts automatically.

Restarting playback from a particular portion after rewind—Memory play

1 During playback or recording, press RESET at the point from which you want to restart playback later.
The counter is reset to "0M 00S".

2 Press MEMORY so that the MEMORY indicator lights up.

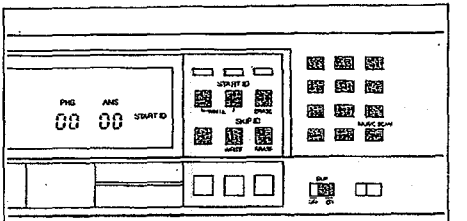


Lights up.

3 After playback or recording, press PLAY while pressing ◀◀.
When the counter is returned to "0M 00S", playback starts automatically.

Sub codes

In the DAT deck, "sub code" signals can also be written on the tape in addition to the audio signal. Using the sub codes, you can easily cue the selections and edit the tapes. These sub code signals can be written during recording or during playback after recording has been made. In playback, the sub code signals can be freely erased or re-written with the previously recorded audio signals left as they are.



Buttons used to write or erase sub codes

Sub codes available with this deck	Functions of each sub code in playback
Start ID (code indicating the beginning of the selection)	• Location the beginning of the selections (AMS) • Music scan
Program number (indicating the selection order)	• Searching for the selection by designating the selection number
Skip ID (code for skip operation)	• Unwanted portions can be skipped

To return to the beginning of the selection being played
Press |◀◀ once. The AMS display will show "–1".

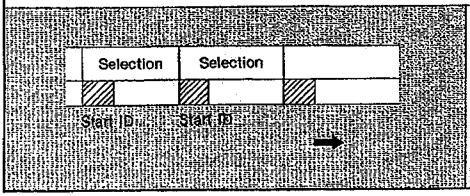
When the PGM (program number) is not displayed
The program number is not recorded on the tape.

Writing start ID

"Start ID" is the code indicating the beginning of a selection. You can easily locate the selection in playback using the start ID codes written on the tape.
To write start ID codes, two methods are available: automatic writing during recording and manual writing during recording or playback at the desired points.
While the start ID is being written (for 9 seconds), none of the buttons except ■ STOP and ⏏ OPEN/CLOSE is operable.

Writing start ID automatically

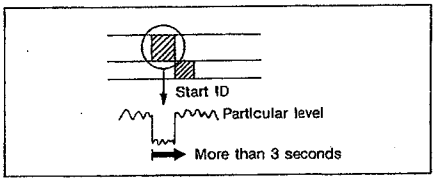
While recording, you can write the start ID automatically at the beginning of each selection.



Before recording, make sure that the AUTO indicator is lit.
If the AUTO indicator is not lit, press AUTO.

How is the start ID automatically written?

1 When the power is turned on and a cassette with its safety tab set to the record-possible position is loaded, the AUTO indicator lights up automatically.
In the timer recording mode, the deck always enters this mode.
2 When the recording level stays lower than a particular level (close to the no-signal level)* for more than 3 seconds, the start ID is written.

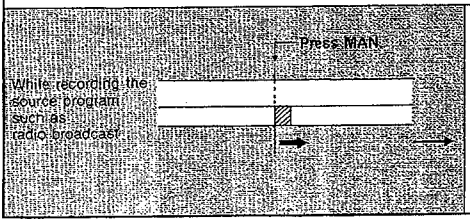


* If there is a portion of very low volume level during a selection, as may occur for instance with classical music, a start ID may be written even in the middle of the selection.

When automatic writting is not required
Press AUTO so that the AUTO indicator goes off.

Writing start ID manually

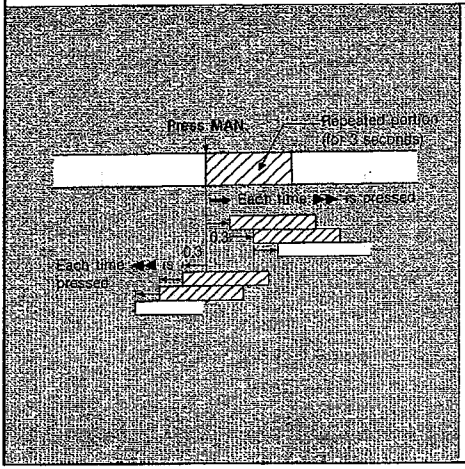
While recording, you can write the start ID at any desired point on the tape.



Press MAN during recording.
From the point where MAN is pressed, the start ID code is written for 9 seconds. During writing, the START ID indicator blinks.

Writing start ID at the desired point—Rehearsal function

The start ID position can be finely adjusted in the following order.
To readjust the start ID position, first erase the previously recorded codes according to "Erasing a start ID".



1 During playback, press MAN at the position where you want to write the start ID.
The MAN indicator blinks.
The portion for 3 seconds from the point where the button is pressed is played back repeatedly.

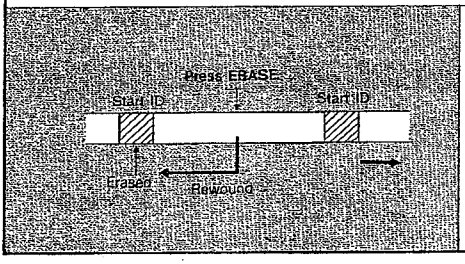
2 While listening to the repeated sound, adjust the "repeat start" point to the desired position by pressing ◀◀ or ▶▶.
The "repeat start" point (beginning of the start ID) is shifted with ◀◀ backwards, and with ▶▶ forward from the current position by approx. 0.3 seconds to each press. (That is, the "repeat start" point is shifted by approx. 1 second when the button is pressed three times.)

3 After the beginning of the start ID is set at the desired point, press MAN again.
The blinking MAN indicator lights up steadily and the start ID code is written for 9 seconds.

If the START ID indicator flickers rapidly
A START ID has already been written. The start ID previously written will be erased.

Erasing a start ID

A single start ID can be erased. When a program number is also written on the tape together with the start ID, both codes will be erased at the same time.



Press START ID ERASE in the stop mode or during playback.
The tape is rewound to the nearest start ID position and the start ID is erased.
While the start ID is being searched for, the ERASE indicator blinks, and while the start ID is being erased, the START ID indicator blinks.

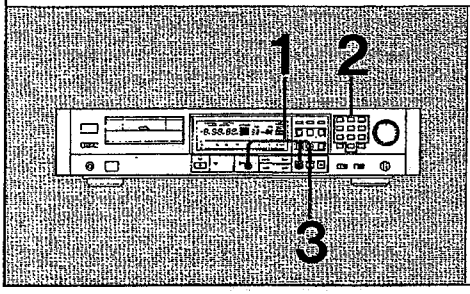
Writing program numbers

"Program number" is the code indicating the selection order, and can be written on the tape together with the start ID. When the program number is written on the tape, the desired selection can be searched for by designating its program number.

The maximum program number allowed is 99.
To write the program number, two methods are available: automatic writing during recording and renumbering at high speed from the beginning of the tape in the numerical order.

Writing program numbers automatically

While recording, the program numbers are automatically written at the beginning of each selection together with the start ID.



1 Set the deck to the record-pause mode.
Press PAUSE, then press PLAY while pressing REC.
At this time, make sure that the AUTO indicator is lit.

2 Enter the program number you want to write first.

3 Press PAUSE to start recording.

Renumbering program numbers

With this function, the progrm numbers on the edited tape can be renumbered automatically.

Press RENUMBER during playback or in the stop mode.
The tape is rewound to the beginning of the tape, and the program numbers are rearranged from "1" in numerical order by detecting the start ID or program number codes.

After the program number is written on the beginning of the selection, the tape is fast-forwarded to the beginning of the next selection automatically. During fast-forwarding, the RENUMBER indicator blinks.

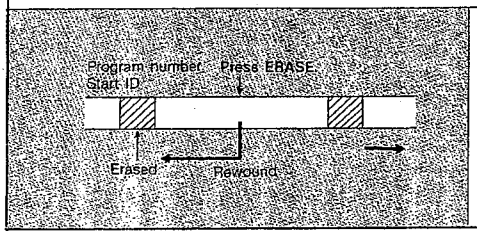
Note
Make sure that the cassette's safety tab is set at the record-possible position.

When the tape reaches the end
The tape is rewound to the beginning of the tape, and stops automatically.

Start ID indicator during renumbering
While the program numbers are being written for the first time or while they are being renumbered, the START ID indicator blinks for 9 seconds. However, if the new program number is the same as that of the previous one, the START ID indicator lights up for approx. 2 seconds and the tape is fast-forwarded to the next start ID point. At this time, the playback sound cannot be heard.

Erasing a program number

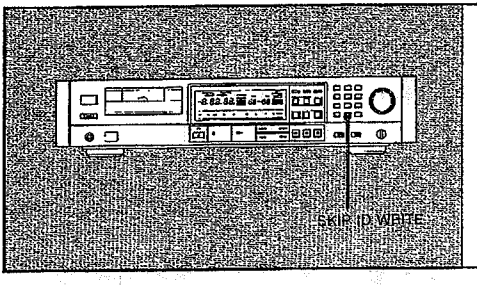
A single program number is erased together with the start ID.



During playback, press START ID ERASE immediately after the tape passes the program number to be erased.
The tape is rewounded to the previous program number position and the program number is erased.
While the program number is being searched for, the ERASE indicator blinks, and while the program number is being erased, the indicator lights up steadily.

Writing skip ID

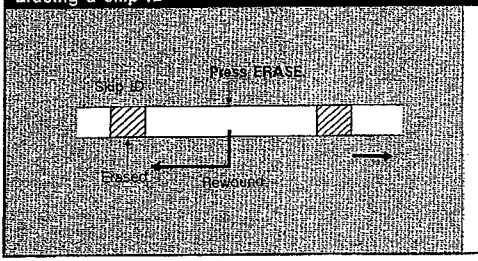
When the skip ID code is detected during playback, the tape skips to the next start ID code. The skip ID can be written during both playback and recording.
Skip ID does not affect the audio signal recorded.



If there is a portion you want to skip later, press SKIP ID WRITE at the beginning of that portion.
The skip ID signal is written for approx. one second automatically from the point where the button is pressed.
While the skip ID is written, the WRITE indicator and the SKIP ID indicator in the display window light up.

Skip ID and start ID
The skip ID code can be written over the start ID.

Erasing a skip ID

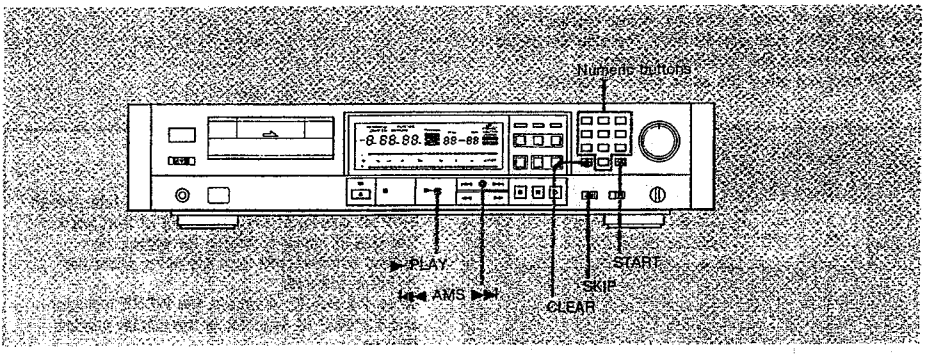


Press SKIP ID ERASE during playback or in the stop mode.
The tape is rewounded to the previous skip ID position and the skip ID code is erased.
While the skip ID is being searched for, the ERASE indicator blinks, and while the skip ID is being erased, the indicator lights up steadily.

When the skip ID and the start ID codes are overwritten

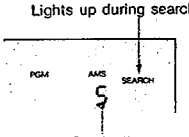
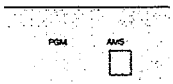
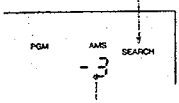
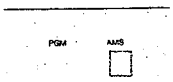
How to erase	ID code to be erased
Press START ID ERASE.	Start ID, skip ID
Press SKIP ID ERASE.	Skip ID

Operation using sub codes



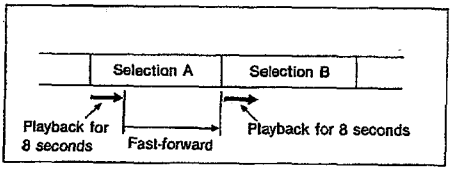
Locating the beginning of a desired selection (AMS)

When ⏮ AMS ⏭ is pressed during playback, playback will start from the beginning of the desired selection.
When it is pressed in the pause mode, the deck enters the pause mode at the beginning of the designated selection. Press PAUSE to resume playback.
For this operation, the start ID codes must be recorded on the tape.

To locate the selection ahead	Press ⏭.	Each time the button is pressed, the tape is advanced to the next selection in sequence. Lights up during search.  When the point 5 selections ahead is designated by pressing ⏭ five times.	When the beginning of the designated selection is detected, playback starts.  Display shows "0" and then goes off.
To locate the previous selection	Press ⏮.	Each time the button is pressed, the tape is returned to the previous selection sequentially. Lights up during search.  When the point 3 selections (including the selection being played) back is designated by pressing ⏮ three times.	When the beginning of the designated selection is detected, playback starts.  Display shows "0" then goes off.

Listening to the beginning of each selection successively—Music scan

Press START.



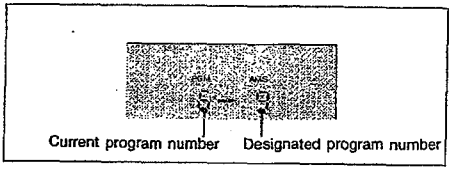
The tape is rewound to the beginning of the tape, then the beginning of selection is played back for 8 seconds sequentially.
During playback, the ▶ indicator on the PLAY button blinks.

To continue playback at that position
Press PLAY while the indicator blinks.
The music scan function is released and the normal playback resumes.
After the indicator stops blinking, and while the next selection is being searched for, pressing PLAY will rewind the tape to the beginning of the current selection then the playback starts.

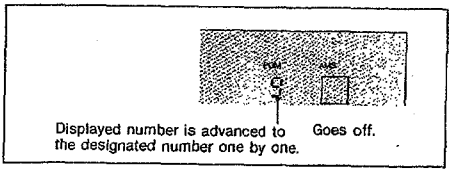
Designating the desired selections

For this operation, the program numbers must be written on the tape.

1 Designate the desired program number with the numeric button(s).



2 Press START.
The designated selection will be searched for at high speed and playback will start from the beginning of that selection.

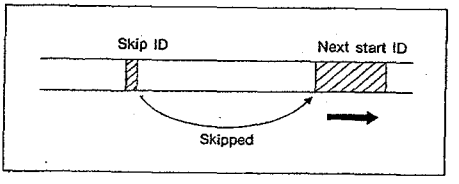


If an incorrect number is designated
Before pressing START, press CLEAR.
The displayed program number will be cleared. Then enter(s) the correct number again.

Skipping an unwanted portion

When a skip ID is detected during playback, the tape skips to the next start ID code automatically.
For this operation, the skip ID must be written on the tape.

Set the SKIP switch to ON during playback.



The tape is fast-forwarded from the skip ID position to the next start ID position, the playback resumes. As long as the SKIP switch is set to on, each time the deck detects a skip ID, the tape moves to the next start ID position.

When the SKIP switch is set to OFF
When the tape passes the skip ID position, the SKIP ID indicator lights momentarily but playback continues without skipping.

Blank section and no-signal recorded portion

In the digital tape recording format, the recorded area is definitely distinguished from the "blank" section (the tape portion on which no recording has been applied ever). Unlike the "blank" section, a track format is constructed on the recorded area, even if no audio signal is recorded.

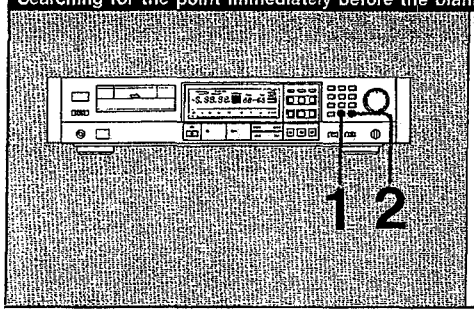
When both blank section and no-signal recorded portion exist on a tape

Search operations using AMS function, for example, may take a quite long time.
Therefore, when recording from the middle of the tape such as editing the tape, make sure that no blank section will be left on the tape.
If no-signal portions are required between selections, use the record muting function (refer to page 15).

To leave no blank section on the tape

Start recording from the position immediately before the "blank" section. The blinking sampling frequency indicator in the display shows that the tape reaches the "blank" section.

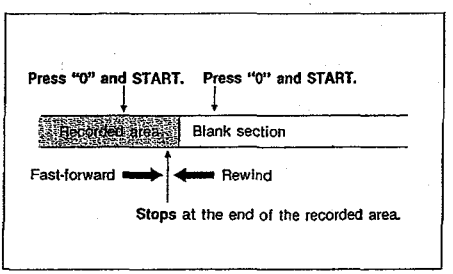
Searching for the point immediately before the blank (Blank search)



1 **Press the numeric button "0".**

2 **Press START.**
The sampling frequency indicator blinks in the display window, and the "blank" search operation starts at a high speed*, the tape stops at the beginning of the "blank" section.

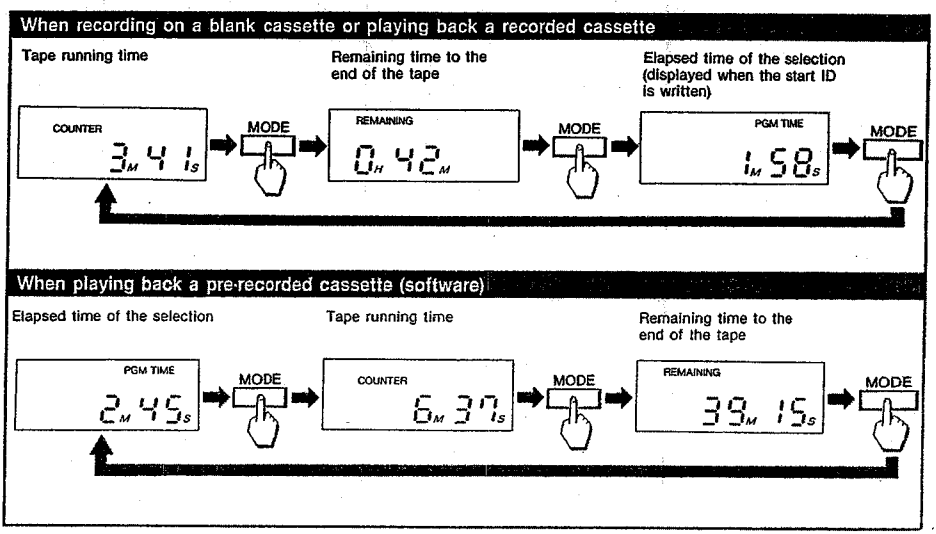
*When the blank search operation starts from the point within a recorded area, the tape is advanced in normal fast-forwarding speed. When the blank search operation starts from the "blank" section, first the tape is rewound at a three-times the normal playing speed to return to the end of the recorded area, and then stops.



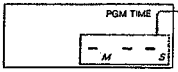
Using the counter

The time counter display shows the followings:
- Tape running time
- Elapsed time of the selection
- Total time remaining on the tape

Each time the MODE button is pressed, the information will be switched.



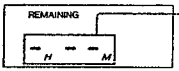
Elapsed time of the selection is not displayed when...
- The start ID is not entered on the tape



Even though the selections are recorded, the time information is not displayed. In this case, the COUNTER display may be used as a rough reference.

- ◀◀ or ▶▶ button is pressed in the stop mode. The display is changed automatically to the COUNTER display.

Remaining time is not displayed in the following cases
- Immediately after the deck is set to the playback or recording mode after loading a cassette.



Blinks and the remaining time display is not shown. It will be displayed approx. 16 seconds later.

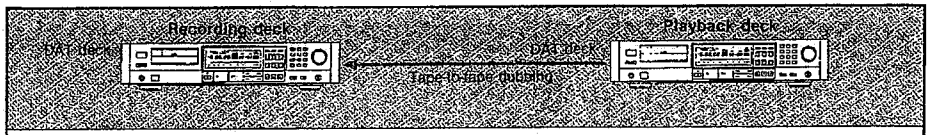
- During search operation using ⏮ AMS ⏭, ◀◀ or ▶▶ button, or during fast-forwarding or rewinding. The remaining time will not be shown even if MODE is pressed.
- During playback of the "blank" section on the tape.

Accuracy of the electronic linear time counter
The linear time counter provided with this unit is not a clock. The time indicated by the counter may slightly differ from the actual recording/playback time. This allowance differs for the length of the tape or running position, etc.

When pre-recorded tape (software) is used
Each time the tape is played back, the PGM TIME display is resumed even if the COUNTER display is recalled by pressing MODE.

Digital dubbing

When two DAT decks are connected to each other, digital-to-digital tape dubbing is possible.
When the start ID and skip ID codes are written on the playback tape, they are transferred to the recording tape as they are.
The recording level is also set at the same condition as the playback tape. However, program numbers are not transferred to the other.



1 Set INPUT SELECT to DIGITAL.
The START ID AUTO indicator goes off.

2 Insert a recordable cassette.
Be sure to set the safety tab to its record-possible position.

3 Set the deck to the record-pause mode.
Press PAUSE, then press PLAY while pressing REC.

When recording sub-code signals from the beginning:
- For the start ID (when it is not written on the playback tape)
  —Press AUTO (page 18).
- For the program number
  —Designate the first number with numeric button(s) (page 20).

4 Insert the original cassette for playback.

5 Search for the recorded section to be dubbed.

6 Press PAUSE of the recording deck to release the record-pause mode, and at the same time, press PLAY on the playback deck.
Dubbing begins.

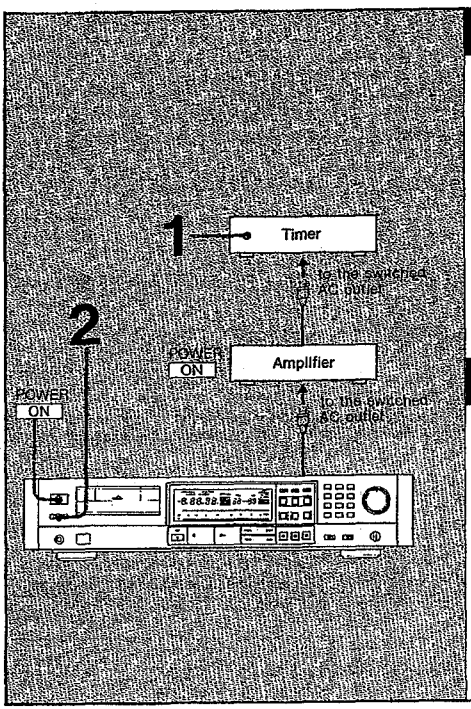
When the signal has already been recorded in the front part of the tape
Search for the "blank" section using the blank search function (page 24).
—Press "0" then START.

When the COPY PROHIBIT indicator blinks
When a pre-recorded (software) tape is used for digital dubbing, the COPY PROHIBIT indicator may blink on the recording deck to show that the contents of the tape loaded in the playback deck cannot be used for digital (digital-to-digital) dubbing, as a "copy prohibition" code is written on the pre-recorded tape.

Playback equipment
Other than this DAT deck itself, the DA converter unit DAS-702ES or DAS-703ES is available for digital recording operation.

Timer recording/playback

When a commercially available audio timer is used, tape recording/playback can be started at the desired time.



Starting recording at the desired time (Timer recording)

Set the deck to the record-standby mode according to the procedures 1 to 3 in "Recording" on page 13.

1 Set the timer to the desired time.
The deck's power will be turned off.

2 Set TIMER to REC.
The power is supplied to the deck at the preset time and recording starts after approx. 4 seconds.

Starting playback at the desired time (Timer playback)

Set the deck to the playback mode according to the procedures 1 to 2 in "Playback" on page 16.

1 Set the timer to the desired time.
The deck's power will be turned off.

2 Set TIMER to PLAY.
The power is supplied to the deck at the preset time and playback starts after approx. 4 seconds.

When timer recording/playback is finished
Be sure to set the TIMER switch to OFF.
If the switch is left at the REC position, recording will start automatically when the power is next turned on and the contents of the previously recorded tape might be erased.

Precautions
- Although the power of the connected equipment is turned off when the timer is preset, leave the POWER switches of the equipment turned on.
- In the timer recording, the auto rewind operation does not function even if the tape is fully taken up. The tape stops without being rewound so that recording will not be performed over the previously recorded material.

Toubleshooting guide

Symptom	Cause (and remedy)
The function buttons will not operate.	For 4 seconds after the power is turned on, the buttons do not activate. Wait until the blinking of the ▮▮ indicator goes off and then try again.
The tape operation buttons will not operate.	While writing the start ID (9 seconds), buttons except for ■ STOP and ⏏ OPEN/CLOSE buttons will not operate.
The cassette is rejected after being loaded.	The cassette is inserted incorrectly.
The ▶, ▶▶ and ▶▶| buttons will not operate.	If the tape is wound completely, press ◀◀ or |◀◀ button to rewind.
The following buttons will not operate: REC, START ID, SKIP ID and RENUMBER.	The tab of the cassette is open. (See page 12.)
The tape does not move.	The ▮▮ PAUSE button is activated.
The CAUTION indicator appears suddenly while the tape is running.	Defective or damaged cassette is inserted. While the ⏏ OPEN/CLOSE button is blinking, press this button and try another cassette.
The tape stops running before reaching the beginning of the tape.	If MEMORY indicator is displayed, press the COUNTER MEMORY switch so that the indicator goes off.
The tape running noise is heard during fast forward or rewind.	This may happen depending on the type of tape used.
No recording can be made.	If the tape is wound completely, press ◀◀ or |◀◀ button to rewind.
	The tab of the cassette is open. (See page 12.)
	Nothing is connected to the DIGITAL IN jacks, although the INPUT SELECT switch is set to DIGITAL.
	Digital recording is to be made at the sampling frequency of 44.1 kHz. The COPY PROHIBIT indicator appears and the deck enters the recording pause mode. In this case, recording cannot be made.
Recording cannot be made, even though the unit was set in record mode.	Nothing is connected to the LINE IN jacks on the rear, although the INPUT SELECT switch is set to ANALOG.
	The recording level is turned down completely.
Recording or playback cannot be done.	Incorrect connection. (See page 5.)
	Incorrect operation of the connected amplifier. Refer to the operating instructions of the amplifier.
Unbalanced left and right volume.	Incorrect adjustment of the recording level.
Search function activated suddenly.	The SKIP switch is set to ON.
Search speed becomes slow.	There is a blank section between selection. Use the blank skip function when recording so that no blank is created.
Search function does not activate.	If the start ID is less than 9 seconds long, erase it, and then write it again.
	The portion between start ID codes is less than 18 seconds long. It may occur when writing start ID manually.
	If the selected program number does not exist on the tape, or the entered number is out of order, press the RENUMBER button.
Start ID cannot be written during recording.	A new start ID cannot be written for 9 seconds after another start ID.

Specifications

System	Digital audio tape recorder
Tape	Digital audio tape
Recording system	Rotary head
Recording time	120 minutes (with DT-120)
Tape speed	8.15 mm/s
Drum rotation	Approx. 2,000 rpm
Error correction	Double Reed Solomon code
Number of channel	2 channels, stereo
D/A conversion	16-bit linear
Frequency response	2–22,000 Hz ±0.5 dB
Signal to noise ratio	More than 92 dB
Dynamic range	More than 90 dB
Total harmonic distortion	Less than 0.0055%
Wow and flutter	Below measurable limit

Input

Input jacks	Jack type	Impedance	Rated input level
LINE IN	Phono	50 kohms	−10 dBs
DIGITAL	Phono	75 ohms	0.5 Vp-p

Output

Output jacks	Jack type	Impedance	Rated output	Load impedance
LINE OUT	Phono	470 ohms	−10 dBs	More than 10 kohms
HEAD-PHONES	Stereo phone	150 ohms	0–28 mW	32 ohms
DIGITAL OUT	Phono	75 ohms	0.5 Vp-p	75 ohms

Tape

Track pitch	13.6 μm (20.4 μm)
Sampling frequency	48 kHz, 44.1 kHz, 32 kHz
Modulation system	8–10 Modulation
Transfer rate	2.46 Mbit/sec. (before modulation)

General

Power requirements

Model for European countries	220 V AC, 50/60 Hz
Model for the United Kingdom	240 V AC, 50 Hz

Power consumption	48 W
Dimensions	Approx. 470 × 100 × 420 mm (w/h/d) ($18\frac{1}{2} \times 3\frac{15}{16} \times 16\frac{1}{2}$ inches) incl. side wood
	Approx. 430 × 100 × 420 mm (w/h/d) ($16\frac{15}{16} \times 3\frac{13}{16} \times 16\frac{1}{2}$ inches) excl. side wood
Weight	Approx. 12 kg (26 lb 7 oz) incl. side wood

Remote commander (supplied)

Remote control system	Infrared control
Power requirements	3 V DC, with R6 (size AA) batteries
Dimensions	Approx. 67 × 175 × 18 mm (w/h/d) ($2\frac{5}{8} \times 6\frac{7}{8} \times \frac{11}{16}$ inches)
Weight	Approx. 145 g (5 oz) incl. batteries

Supplied accessories

Remote commander (1)
Sony batteries SUM-3 (NS) (2)
Audio connecting cords (2 phono plugs × 2 phono plugs, stereo, for line inputs and outputs) (2)
Screws to secure the cabinet (4)*

* The side wood panels on both sides of the deck are detachable. After removing the screws, secure the cabinet with the supplied lock screws (four M4 × 6). For safety, before doing this, be sure to disconnect the AC power cord from the AC outlet.

Design and specifications subject to change without notice.

Note

This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

Technical information

The technical development of the analog tape deck has progressed as far as its technology would allow in the improvement of the sound quality.
In the search for even better sound reproduction, digital audio technology was developed.

With digital audio, an analog signal is encoded into a digital signal which consists of a stream of 0's and 1's. To keep the continuity of the sound signals which is essential for music, these separate digital signals are rearranged through a digital memory function.

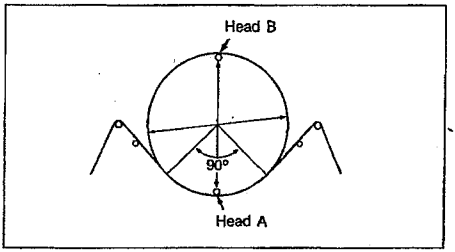
Now that digital audio has been commercialized through the Compact Disc player, many audiophiles have experienced audio reproduction with wide dynamic range, low distortion and high signal-to-noise ratio not previously available.

To meet the demand for recording this remarkable sound reproduction, the technology of the CD have been applied to DAT. And by adding the signal error correction process to the digital track, an extremely stable and high-density recording has become possible.

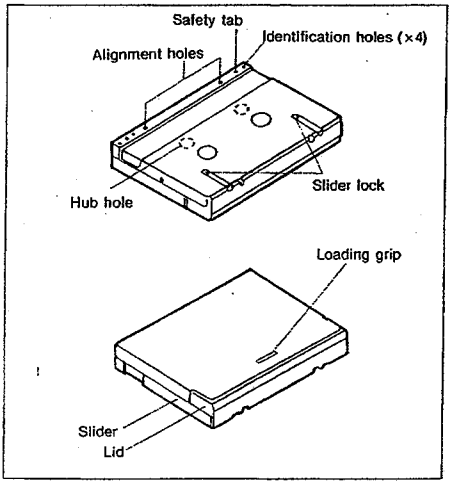
The distinctive feature of the DAT as a new medium for digital audio is its digital recording capability by which you can digitally record desired selections by yourself. Moreover, writing sub codes which is convenient for playback is also possible.

High-density recording

To record and playback the digital signal encoded from the analog signal, a recording and playback system which ensures the frequency range of a few megahertz is necessary. This was impossible for the conventional multi-channel audio tape deck with stationary head. In order to solve this problem, the DAT deck uses a rotary head.
The DAT employs a 2-head system with the tape wrapping around 90°. The tape to be used is a metal tape. These factors allow you a recording density of 114 M bit/inch², ten times higher than that of the conventional PCM processor.

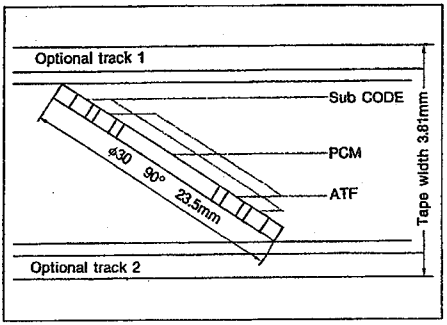


Structure of the DAT cassette

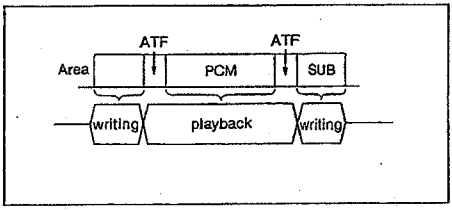


- Designed to prevent contamination of the tape
- Dimensions: 73×54×10.5 mm ($2^7/_8 \times 2^1/_8 \times 7/_{16}$ inches)
- Safety tab with sliding mechanism.

Track format



PCM area: The PCM (pulse code modulation) sound signal is written in this area.
ATF area: ATF (automatic tracking finding) signal is written, enabling a stable tracking performance of the rotating head.
Sub-code area: Codes used for high-speed search operation, etc. are written in this area. With this deck, the start ID, the program number and the skip ID are available as sub codes.



We are sure that you are satisfied with the sound quality and operating performance of out compact and functional DAT deck.